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## NOTICE OF ALLOWANCE AND FEE(S) DUE

21186 7590 12/19/2008

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.  
P.O. BOX 2938  
MINNEAPOLIS, MN 55402

EXAMINER

TSAL SHENG JEN

ART UNIT

PAPER NUMBER

2186

DATE MAILED: 12/19/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,588	08/18/2003	Kitrick Sheets	1376,720US1	4010

TITLE OF INVENTION: SHARING MEMORY WITHIN AN APPLICATION USING SCALABLE HARDWARE RESOURCES

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	03/19/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

### HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER:** Utility patents issued on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

# **PART B - FEE(S) TRANSMITTAL**

**Complete and send this form, together with applicable fee(s), to:** Mail **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
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 or Fax **(571)-273-2885**

**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

21186 7590 12/19/2008

**SCHWEGMAN, LUNDBERG & WOESSNER, P.A.**  
**P.O. BOX 2938**  
**MINNEAPOLIS, MN 55402**

## **Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/643,588 08/18/2003

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nonprovisional	NO	\$1510	\$300	\$0	\$1810	03/19/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
TSAL SHENG JEN	2186	711-206000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.  
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_  
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_  
 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee  
☐ Publication Fee (No small entity discount permitted)  
☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.  
☐ Payment by credit card. Form PTO-2038 is attached.  
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_  
 Typed or printed name \_\_\_\_\_ Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 25 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 25 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

**Notice of Allowability****Application No.**

10/643,588

**Examiner**

SHENG-JEN TSAI

**Applicant(s)**

SHEETS, KITRICK

**Art Unit**

2186

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 10/8/2008.
2. ☒ The allowed claim(s) is/are Original claims 1, 4-6, 9-11 and 14-19.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of the:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.  
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached  
1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.  
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.  
**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 10/6/2008
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

/Sheng-Jen Tsai/  
TFSA Examiner, Art Unit 2186

### DETAILED ACTION

1. This Office Action is taken in response to Applicants' Amendments and Remarks filed on October 8, 2008 regarding application 10/643,588 filed on August 18, 2003.
2. Claims 1, 6 and 11 has been amended.  
Claims 2-3, 7-8 and 12-13 have been cancelled.  
Claims 19-20 have been added.  
Claims 1, 4-6, 9-11 and 14-20 are pending under consideration.

### EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
4. Authorization for this examiner's amendment was given in a telephone interview with Rodney L. Lacy (Reg. No. 41,136) on 12/09/2008.

Please enter the amendments filed on 10/8/2008, and further amend the "Related Filed" section of the **Specification**, independent claims **1, 6 and 11**, and dependent claims **4, 9 and 20** of this application as shown below:

It should be noted that the modifications (deletion denoted as strikethrough and addition denoted as underline, and both denoted with red color) presented in the following Examiner's Amendments are based on the amended claims filed on 10/8/2008.

5. The "Related Filed" section of the Specification is now amended to be:

This application is related to U.S. Patent Application No. 10/643,758, entitled "REMOTE TRANSLATION MECHANISM FOR A MULTINODE SYSTEM", filed on even date herewith; to U.S. Patent Application No. 10/235,898 (now US 6,922,766), entitled "REMOTE TRANSLATION MECHANISM FOR A MULTINODE SYSTEM", filed September 4, 2002; to U.S. Patent Application No. 10/643,744, entitled "Multistream Processing System and Method", filed on even date herewith; to U.S. Patent Application No. 10/643,577, entitled "System and Method for Synchronizing Memory Transfers", ~~Serial No.~~ filed on even date herewith; to U.S. Patent Application No. 10/643,742, entitled "Decoupled Store Address and Data in a Multiprocessor System", filed on even date herewith; to U.S. Patent Application No. 10/643,586 (now US 7,334,110), entitled "Decoupled Scalar/Vector Computer Architecture", filed on even date herewith; to U.S. Patent Application No. 10/643,585, entitled "Latency Tolerant Distributed Shared Memory Multiprocessor Computer", filed on even date herewith; to U.S. Patent Application No. 10/643,754, entitled "Relaxed Memory Consistency Model", filed on even date herewith; to U.S. Patent Application No. 10/643,758, entitled "Remote Translation Mechanism for a Multinode System", filed on even date herewith; and to U.S. Patent Application No. 10/643,741 (now US 7,437,521), entitled "Method and Apparatus for Local Synchronizations in a Vector Processor System", filed on even date herewith, each of which is incorporated herein by reference.

**6. Claim 1 is now amended to be:**

1. (Currently Amended) A method for translating a virtual memory address into a physical memory address in a multi-node system, the method comprising:

maintaining a remote translation table (RTT) to store virtual to physical memory translations;

~~initializing~~ maintaining in a generally accessible memory an emulated remote translation table (ERTT) segment to store virtual to physical memory translations;

providing the virtual memory address at a source node;

determining that a translation for the virtual memory address does not exist;

determining that the ERTT is to be used to translate the virtual memory address and

that the RTT is not to be used to translate the virtual memory address, wherein

determining that the ERTT is to be used includes determining that the source node is operating in a kernel mode;

determining a virtual node to query based on the virtual memory address; accessing an ERTT header to obtain a mapping of the virtual node to a physical node;

querying the ERTT segment on the physical node for the translation for the virtual memory address; and

loading the translation into a translation lookaside buffer (TLB) on the source node.

7. **Claim 4 is now amended to be:**

4. (~~Previously Presented~~ Currently Amended) The method of claim 3-1, further comprising locating the ERTT header at a well known location to one or more nodes used by an application.

8. **Claim 6 is now amended to be:**

6. (Currently Amended) A computerized system for managing virtual address translations, the system comprising:

a plurality of nodes available for executing programs, each of said nodes having a node memory;

an RTT on each of the plurality of nodes for managing virtual address translations;

an ERTT to store virtual to physical memory translations, wherein the ERTT is in a different memory from the RTT

an ERTT header having one or more mappings of virtual nodes to physical nodes;

an operating system executable by a source node of the plurality of nodes, the operating system operable to:

receive a virtual memory address at the source node;

determine that a translation for the virtual memory address does not exist on the source node;

determining that the ERTT is to be used to translate the virtual memory address and that the RTT is not to be used to translate the virtual memory address, wherein determining that the ERTT is to be used includes determining that the source node is operating in a kernel mode;

determine a virtual node to query based on the virtual memory address; access the ERTT header to obtain a physical node mapped by the virtual node; query an emulated remote translation table (ERTT) segment the ERTT in the generally accessible memory on the physical node for the translation for the virtual memory address; and



loading the translation into a translation lookaside buffer (TLB) on the source node

**9. Claim 9 is now amended to be:**

4. (~~Previously Presented~~ Currently Amended) The system of claim 3-6, wherein the ERTT header at a well known location to one or more nodes used by an application.

**10. Claim 11 is now amended to be:**

11. (Currently Amended) A computer-readable medium having computer executable instructions for executing a method for translating a virtual memory address into a physical memory address in a multimode system, the method comprising:

maintaining a remote translation table (RTT) to store virtual to physical memory translations;

~~initializing-maintaining~~ in a generally accessible memory an emulated remote translation table (ERTT) segment to store virtual to physical memory translations, wherein the RTT is in a different memory from the ERTT;

providing the virtual memory address at a source node;

determining that a translation for the virtual memory address does not exist;

determining that the ERTT is to be used to translate the virtual memory address and that the RTT is not to be used to translate the virtual memory address, wherein determining that the ERTT is to be used includes determining that the source node is operating in a kernel mode;

determining a virtual node to query based on the virtual memory address;  
accessing an ERTT header to obtain a mapping of the virtual node to a physical node;  
querying the ERTT segment on the physical node for the translation for the virtual  
memory address; and  
loading the translation into a translation lookaside buffer (TLB) on the source node

11. **Claim 20 is now amended to be:**

Claim 20 is cancelled.

12. **EXAMINER'S COMMENT**

Claims 11, 14-15 and 18 recite "a computer-readable medium." While the Specification does mention the subject matter of "computer-readable media," it nevertheless does not provide definition regarding what are considered as "computer-readable media."

It should be understood that when the computer-readable medium is not defined, the claims are read to include only statutory embodiments. Thus the "computer-readable medium" recited in claims 11, 14-15 and 18 is limited to only statutory type of media.

***Allowable Subject Matter***

13. Claims 1, 4-6, 9-11 and 14-19 are allowed.

***Conclusion***

14. Claims 1, 4-6, 9-11 and 14-19 are allowed.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheng-Jen Tsai whose telephone number is 571-272-4244. The examiner can normally be reached on 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sheng-Jen Tsai/

TFSA Examiner, Art Unit 2186

December 17, 2008